REMARKS

Claims 12-24 are pending. Independent claims 12, 16, and 21 are amended, without the addition of new matter, to recite a branching mechanism that routes a signal alternatively to/from the switching unit or a receiver/transmitter. Support for these amendments is found throughout Applicants' specification as filed, and in particular at Figs. 3-5 and p. 6, lines 4-9 ("In order to avoid the power losses resulting therefrom, the branching means are preferably formed as switches which, at a given instant, forward an information signal either only to the switching unit or only to a transponder, or which receive an information signal either only from the switching unit or only from the signal converter unit.").

The Office rejected claims 12 and 16 under 35 U.S.C. § 103 as being unpatentable over U.S. Patent Application Publication No. 2002/0064336 to Graves *et al.* ("Graves"), and claim 21 over Graves in combination with U.S. Patent Application Publication No. 2009/0142060 to Strasser *et al.* ("Strasser"). To establish a *prima facie* case of obviousness, the prior art reference (or references when combined) must teach or suggest all the claim limitations. MPEP § 2143. Graves fails to teach or suggest the limitations of claims 12, 16, or 21 for which it is cited.

Claim 12 recites the input, claim 16 the output, and claim 21 both the input and output, of an inventive switching node in a Wavelength Division Multiplex (WDM) optical network that allows the protection path of an optical signal to pass a node, even if a failure in the node blocks the working path of the signal. Figure 1 depicts a prior art solution that does not offer such protection, since the optical switching unit 12 is a single-point failure. That is, there exists no way to route a working path and protection path of an optical signal, at the same wavelength, through the node such that one of the signals will survive (or can be configured to survive) a failure of the optical switching unit 12. This is because the transponders 6, which may extract

one of the signals of interest and/or re-inject it into the WDM network, are both tied directly to the optical switching unit 12.

As depicted in block diagram form in Figure 2, embodiments of the present invention interpose a branching mechanism 7 between the optical mux/demux interfaces 1 and the optical switching unit 2, and connect a transponder 6 directly to each branching mechanism 7, not to the optical switching unit 2. As depicted in, *e.g.*, Figure 3, the branching mechanism 7 includes optical switches 9 configured to direct outputs of a demultiplexer 4 either to an appropriate input of the optical switching unit 2, or to a receiver 10 in the transponder 6 (claim 12). Similarly, optical switches 9 are configured to feed into inputs of the multiplexer 5, either outputs from the optical switching unit 2 or the output of a transmitter 13 in the transponder 6 (claim 16; claim 21 recites both). In this manner (referring again to Figure 1), if the optical switching unit 2 fails, either the working path of an optical signal or its protection path may be extracted from the network by a transponder 6, and routed through a controller 12 (Fig. 3) to the same or another transponder 6, and injected directly into the WDM network signal, bypassing the failed optical switching unit 2.

Graves fails to teach or suggest this approach to network protection. Rather, Graves discloses providing protection for the partial failure of an optical switching unit 12 by applying incremental redundancy and complex control mechanisms. Graves' basic node, depicted in Fig. 2, comprises input demultiplexers 16a – 16n, optical switch matrices 12a – 12m, and output multiplexers 18a – 18n. Note that, like the prior art node of Applicants' Figure 1, the Wavelength Converting Switch 14, which performs add/drop functions, is directly connected to the switching matrix. Accordingly, as described above, if the switching matrix 12 fails, neither a working path nor protection path of an optical signal can pass the node.

In Fig. 3, Graves depicts protecting against a partial failure of the switching matrix 12 by adding an additional input demultiplexer 16n+1, input protection switches 56a – 56n+1, an

additional switching matrix 12m+1, output protection switches 58a – 58n+1, and an additional output multiplexer 18n+1. Graves also adds control elements 20, 50, 60, 62, and switches 52 and 54 on the inputs and outputs, respectively. As depicted in Fig. 6, if a switching matrix ("card") 12a –12m fails, input and output protection switches are activated to route the optical signal(s) affected through the spare, or reserve, switching matrix 12m+1 (and a test signal through the failed switching matrix). Graves thus protects the switching matrix 12 from a partial failure by adding incremental redundancy in the form of a spare switching matrix 12m+1, and the complex protection switches and control mechanisms necessary to dynamically replace a failed switching matrix 12a – 12m with the spare switching matrix 12m+1.

In all cases, Graves' input protection switches 56a – 56n+1 switch an optical signal from an input multiplexer 16a – 16n+1 only to either a switching matrix 12a – 12m or the spare switching matrix 12m+1. In no case does any input protection switch 56a – 56n+1 switch an optical signal to either a switching matrix 12a – 12m+1 or a receiver, as recited in claim 12. In all cases, Graves' output protection switches 58a – 58n+1 switch an optical signal only from either a switching matrix 12a – 12m or the spare switching matrix 12m+1, to an output multiplexer 18a – 18n+1. In no case does any output protection switch 58a – 58n+1 switch an optical signal from either a switching matrix 12a – 12m+1 or a transmitter, as recited in claim 16. Obviously, Graves does not disclose the limitations of claim 21, which recites both.

The Office effectively admitted this teaching of Graves in the rejection of claim 12. "[W]here element 56 selectively supplies each input channels to the switching unit 12a-12m when it's working, or to the drop channels by way of additional switching unit 12m+1 when switching unit 12a-12m has a failure." p. 3, lines 2-4. Claim 12 does not recite any input branching mechanism supplying an input channel to a receiver "by way of" any other circuit element. Rather, claim 12 recites, "an input branching mechanism disposed on the path of the input channels between each optical interface and the switching unit to selectively supply an

input channel alternatively to the switching unit or to the receiver." As explained above, the difference is critical, as the optical node of claim 12 will pass an input signal when the entire switching matrix 12a – 12m+1 fails; Graves will not. Furthermore, the optical node of claim 12 will pass an input signal when one of the "normal" switching matrices 12a – 12m, and the spare node 12m+1, both fail; Graves will not. For at least the reason that Graves fails to teach or suggest selectively switching an input between a switching element and a receiver, the § 103 rejection of claim 12 is improper and must be withdrawn. Similarly, Graves fails to teach or suggest the corresponding limitations of claims 18 or 21.

The combination with Strasser fails to cure the deficiency of Graves to teach or suggest the limitations for which it is cited. Accordingly, the § 103 rejection of claim 21 is improper and must be withdrawn

The Office rejected claims 15 and 20 under 35 U.S.C. § 103 as being unpatentable over Graves in view of Examiner's Official Notice of the use of electrical-optical converters. Applicants traverse the assertion of Official Notice, and respectfully request that the Examiner cite published prior art to establish a *prima facie* case of obviousness.

> Official notice unsupported by documentary evidence should only be taken by the examiner where the facts asserted to be well-known, or to be common knowledge in the art are capable of instant and unquestionable demonstration as being well-known. . . . It would not be appropriate for the examiner to take official notice of facts without citing a prior art reference where the facts asserted to be well known are not capable of instant and unquestionable demonstration as being well-known. For example, assertions of technical facts in the areas of esoteric technology or specific knowledge of the prior art must always be supported by citation to some reference work recognized as standard in the pertinent art.

MPEP § 2144.03 A (emphasis in original). The details of WDM optical network nodes are quintessentially "technical facts in the areas of esoteric technology," which "must always be supported by citation to some reference work recognized as standard in the pertinent art." *Id.* (emphasis added). Accordingly, the § 103 rejections of claims 15 and 20 based on Official Notice are improper and must be withdrawn.

All dependent claims include all limitations of their respective parent claim(s), and thus also define patentable nonobviousness over the art of record. All pending claims are now in condition for allowance, which prompt action is hereby respectfully requested.

Respectfully submitted,

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